## Space Weather Forecast

Issued on Thursday, 14 July 2022 at 01:17 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Chance of R1-R2 blackouts throughout, with a slight chance of R3 blackouts and S1.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Low, with only Common-class flares observed over the past 24 hours. There are presently four sunspot regions on the visible disc. Three of these regions are rather large, with one in the northwest magnetically complex. The other region, is relatively small and simple but has shown signs of development. There are also numerous large filaments on the visible side of the Sun, however there were no signs of instability in these in the reporting period, but will need to continue to be monitored. Therefore, no Earth-directed Coronal Mass Ejections (CMEs) were observed in the available imagery in the last 24 hours.

**Solar Wind / Geomagnetic Activity:** The solar wind has been slightly elevated to elevated, between 450 and 560 km/s over the past 24 hours, most likely under the influence of fast wind from coronal hole 99, with the CME which left the Sun on the 9th July now thought to have missed Earth. The magnetic field strength carried by the solar wind was mostly weak as was the important north-south component. The corresponding geomagnetic activity was Quiet (Kp1-2).

**Energetic Particles / Solar Radiation:** No solar radiation storms were observed.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Solar activity is expected to be Low to Moderate, with a slight chance of strong (X-class) flares.

**Solar Wind / Geomagnetic Activity:** Solar winds are expected to remain elevated on day 1 (14th) due to the fast wind from a coronal hole. Through days 2 and 3 (15th-16th) they are forecast to ease towards background levels as coronal hole effects wane. No other enhancements are currently expected during the period. Geomagnetic activity is expected to initially be Quiet to Unsettled, with a chance of Active intervals. Predominantly Quiet geomagnetic activity is expected on days 3 and 4 (16th and 17th).

**Energetic Particles / Solar Radiation:** The high energy proton flux (greater than 10 MeV) is likely to remain at background levels. There is however a daily Slight Chance of S1 or greater event, due to the presence of two relatively large sunspot regions transiting across the western hemisphere.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 10 | 5 | 1 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 50 | 50 | 50 | 50 |
| Very Active | R3 to R5 X | No | 10 | 10 | 10 | 10 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 10 | 10 | 10 | 10 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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